

# THE OPERATIVE TREATMENT OF CHRONIC INTESTINAL STASIS



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It is a far cry from the massive piles of brick and mortar, cement and marble, steel and iron, which civilized man of today labels the up-to-date apartment house, the modern hotel, the fire-proof "sky-scraper," to the cave-dwellings, the mound-buildings, the kitchen-middens, the dug-out and hovel, which, to primitive man meant "home."

Those who are accustomed to what we call modern sanitation can hardly imagine the life of men of olden times, when the scavengers of field and forest removed for human beings the disease-breeding refuse of communal and individual life. So accustomed have we become to the facilities of modern life that we have almost lost sight of the evolution, through slow and tortuous stages, of sanitary science as we know it today. The plumber and the plumb-line have been greater factors in the development of civilization and the maintenance of health than the casual thinker would imagine.

The trend of the times in the matter of house-building has been steadily toward improvement in every detail. Now, even in rural districts, the housewife is relieved of many of her erstwhile domestic burdens by the sanitary house-builder, or by the architect who is an adherent of modern efficiency methods.

As it is with the home and the business house, so it is with the sanitation of the country, the village and the city. The fact that the laws of sanitary science have penetrated even the jungle and the swamp is proved by the history of the wonderful campaigns which have been waged for the eradication of yellow fever, malarial fever, and certain other scourges which are known as filth diseases.

So much for the evolution of sanitary science as applied to the home, the business house, the country, the village and the

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city. What about *human plumbing*? Have we improved upon the methods of the cave-dweller and the mound-builder? Are our bodily houses so well drained and ventilated, so well regulated in their respective parts, and so perfect in their entire sanitary system, that we may compare favorably the body of civilized man with that of our primitive forefathers? May we compare, in this regard, the progress of human nature, broadly speaking, to the world at large? Has the human country, with its cities of cells, its mountains of muscle, its rivers of blood, its lakes of lymph, and its marvelously intricate system of communication one part with another,—the central nervous system and its branches,—reached as perfect a stage of plumbing and sanitation as has the country at large, with its well-drained valleys, its cabled mountains, its well-ordered cities and villages, its purified lakes and streams, and its wonderful systems of communication? Not absolutely so.

Coincidental with the perfection of sanitary science as applied to the home, the hotel, the apartment house, even the tenement, to the “sky-scraper,” the “loft,” even the “sweat-shop,” to the country, the hamlet and the city, has there been developed a general system of human plumbing notable alike in country-side, in hamlet and in metropolis? I think not.

The complexities of civilization seem to have made for detriment to rather than improvement in human plumbing, or rather, to the keeping in good condition, by the individual, of the system of sanitation with which nature has equipped the human species.

The savage who roamed the fields and forests in search of food, and who “mumbled the bones” of his prey when captured, seemed, from all accounts, to have suffered none of the results of defective human plumbing to which civilized man, with his complexity of pursuit and his refinements of diet, is the victim.

The simple existence, the rough, coarse food, the habits of life born of natural and normal impulses, tended to keep primitive man literally “half brother to the ox.” It cannot be doubted that lower animals and primitive human beings suffer temporary interferences with body drainage, but those who have studied aborigines and animals in their native states know how perfect is their system of body-plumbing compared with that of civilized man. It is well known that animals in the wild



state, and even some domesticated animals, such as the cat and the dog, promptly endeavor to remedy temporary interferences with body drainage by seeking out the herb which racial experience or instinct has taught will correct the defect. It is also a matter of ancient record that certain birds, notably the sacred ibis of the Egyptians, give themselves enemata, introducing water for the purpose with the beak "into the channel by which our health demands that the residue of our food shall leave."

When we pass, however, from lower animals to lower man, and on through the various stages of evolution to that which we are accustomed to call highest civilization, we encounter a most anomalous state of affairs. All the accessory factors which make for perfect body-sanitation—skin, teeth, salivary glands—are more or less defective or their function more or less impaired. The exceptions rather prove the rule. As a consequence, more work, or work of an unaccustomed quality, is thrown upon the essential factors—the stomach and the intestines.

If, perchance, the stomach is not fully equal to the superimposed task, which is so often the case in consequence of the many abuses to which it is subjected, it sends the food on into the intestines improperly prepared. Or perhaps the muscles of the stomach, over-worked, are not strong enough to expel the food, so that it is left to ferment and decay, a further impairment of the drainage system takes place, and a condition of stasis supervenes in this vital portion of the sanitary plant.

Worst of all, however, is the crippling of that portion of the drainage system which we know as the intestine, both large and small. This tortuous canal, with its approximate length of six times that of the body, furnishes fruitful soil for abnormalities resulting, many believe, from man's changed estate, as may be seen from the illustrations presently shown.

The drainage system of the body, like that of the house or the city, is subjected to mechanical laws. According to some students of comparative and developmental anatomy, the assumption by man of the upright posture, as opposed to the all-four posture of lower animals, has called for a reconstruction of the mechanical principles governing body-drainage. Portions of the alimentary canal which, in lower animals, were essential to or at least important in the processes of digestion,

assimilation and elimination, are now considered by some investigators to be rudimentary, non-functioning, or, if functioning, not a necessary part of the great plumbing system by which sanitation of the body is maintained.

Thus, in 1901, Sir W. Arbuthnot Lane, of London, for the first time, having reached the conclusion that the human cecum and ascending colon, acting as a "cesspool," might safely be eliminated, suited the action to the theory by excluding the large intestine from the drainage scheme, performing in certain cases his now justly celebrated "short circuit" operation (ileo-colostomy), and later his operation of ileo-colostomy with colectomy.

A year later (1902) Dr. Barclay Smith, of Cambridge, England, expressed the belief that the large intestine is practically a useless encumbrance to man.

In 1903 Metchnikoff's famous book, "The Nature of Man," voiced this new doctrine in such decisive terms as to lend to the idea a more popular phase. "It is no longer rash," he stated, "to say that not only the rudimentary appendix, the cecum, but the whole of the large intestine are superfluous, and that their removal would be attended with happy results."

In substantiation of his views and in vindication of his surgical procedures, Lane has elaborated the mechanical principles upon which he believes the human plumbing system operates, and has directed attention to the important part played in the life history of the individual by a delay in the passage of material along this great drainage canal, the alimentary tract.

According to Lane's theory, the mechanical relations of the alimentary tract, particularly of the large bowel, are changed in consequence of the assumption by man of the erect posture, and the results of these changes are augmented by the sedentary habits of civilized man.

In consequence of the upright position there is a tendency to general and persistent enteroptosis, particularly marked with reference to the large bowel, as is shown diagrammatically by Lane in Fig. 1.

Nature attempts to relieve the strain of this persistent enteroptosis, and the dragging of the displaced bowel is offset, as it were, through hypertrophy of its membranous supports—"the

crystallizations of lines of force," "the crystallizations of resistances,"—a physiological response to a mechanical demand.

This change in the mechanical relations of the large bowel is brought about primarily by the overloading of the large gut and of that portion which serves more especially as the cess-pool of the gastrointestinal tract,—the cecum and the ascending colon.

Through the changed mechanical relations of the bowel, intestinal surfaces not normally in contact come into apposition, with the result that adhesions are formed, which interfere further with the passage of material through the lumen already constricted in consequence of the enteroptosis.

On other occasions I have discussed the etiology of these "crystallizations of resistance," variously called "bands,"

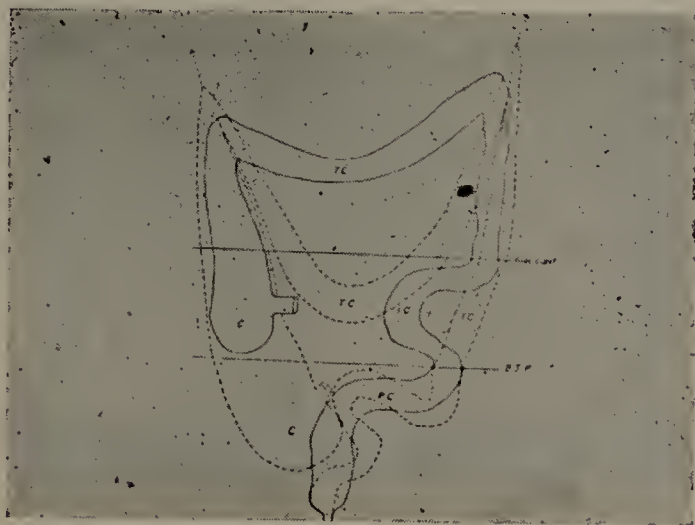


FIG. 1.

"folds," "veils," and "membranes," and need not do so here. I may say, however, in passing, that while some of these intra-abdominal structures are, perhaps, of congenital and others of inflammatory origin, the mechanical or evolutionary theory by which Lane has explained their existence, seems best to account for a major proportion.

Whatever their etiology, and wherever their location, neither they nor the parts of the drainage system involved should be considered as separate entities. In the light of Lane's success, and that of Rutherford Morrison and many others of his followers, in the treatment of tuberculosis and other affections by the correction of the condition of chronic intestinal stasis, it is apparent that the entire problem of body drainage may best



be solved by a consideration of the digestive system *as a whole*. The interesting researches of Carrel with reference to *in vitro* tissue growth, by which he has demonstrated that the death of tissues is due to an inability to eliminate waste products, has given added force to Lane's practical work.

Bearing these facts in mind, let us consider briefly the immediate results of the development of the crystallizations of lines of resistance to downward displacement of the drainage canal.

Lane has shown that these adventitious intra-abdominal structures were formed by nature, in the first instance, for the purpose of off-setting the newly-acquired visceroptotic tend-

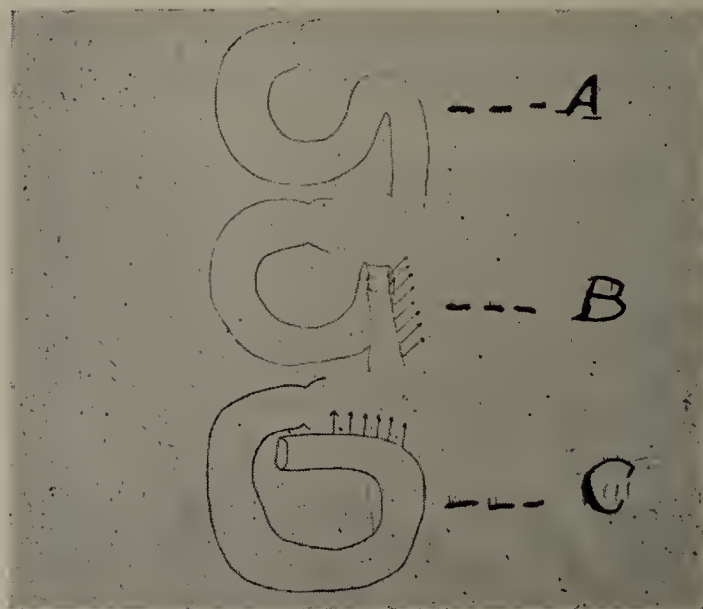


FIG. 2.

ency, and of facilitating drainage. In consequence, however, of an unequal support in different portions of the canal, these structures may and do become the cause of very material obstruction as the result of the kinking of the gut to which they give rise. This obstruction occurs most frequently at certain points of predilection, which are illustrated below.

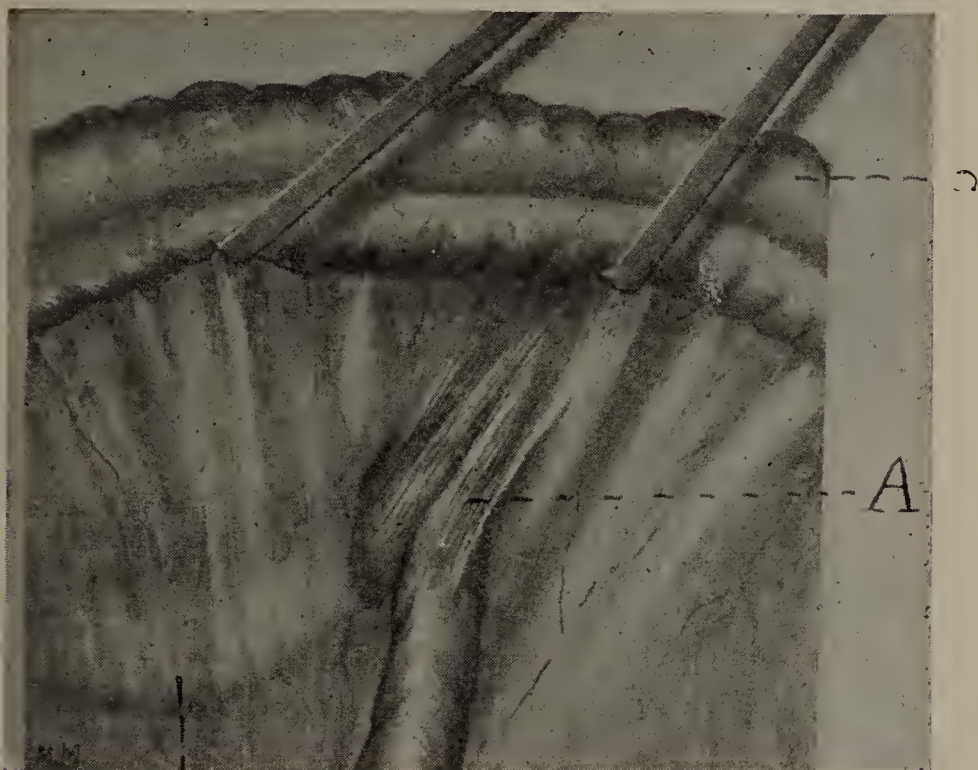
In order to properly interpret the pictures, it is necessary at all times to bear in mind the idea of a fixed point in the length of the gut (the attachment of the band), and the dropping of the hollow viscus on either side of this fixed point, with kinking and narrowing of the lumen.

The points of predilection are as follows:

(1) *In the third part of the duodenum, at the duodeno-jejunal junction.* Fig. 2 illustrates, diagrammatically: A. the



normal curve of the small gut at this point; B. angulation of the duodeno-jejunal junction by bands; C. nature's efforts, by the formation of "resistances," to prevent angulation. Fig. 3 (reproduced, Fig. 13, from the *New York Medical Record*,



B

FIG. 3.

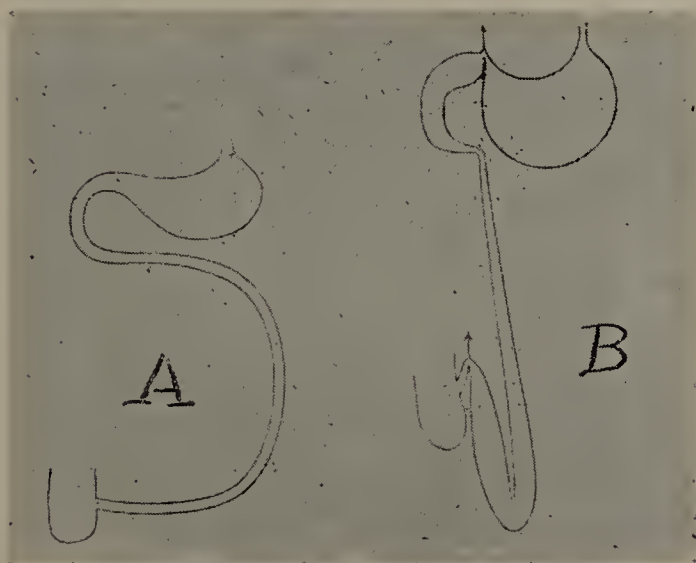


FIG. 4.

September 27, 1913), at A. shows the kink of the duodeno-jejunal junction as actually found at the operating table.

(2) *At the different points along the terminal ileum.* The normal condition of the stomach, small intestine and cecum,



FIG. 4A.

and the several changes which may result from ileal obstruction, are schematically given in Fig. 4, A. and B. Figs. 4a, 4b, and 4c illustrate, as found at operation, the results which may follow the kinking of the terminal ileum by bands, according to Lane's theory.

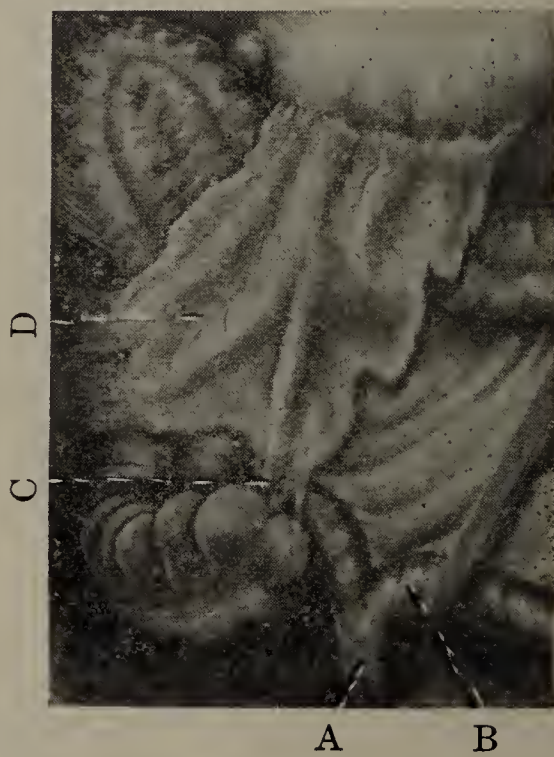


FIG. 4B.

(3) *In the ileo-cecal region, including the appendix.* The appendix may be variously involved. In Fig. 5 it is diagrammatically shown caught to the right in the folds of so-called "Jackson's membrane." The same condition was found at the operating table, as shown in Fig. 5a.



FIG. 4c. New York Polyclinic Hospital, March, 1913. K., female, aged 21 years. Chronic intestinal stasis. A. Duodeno-jejunal kink. B. Dilated duodenum.

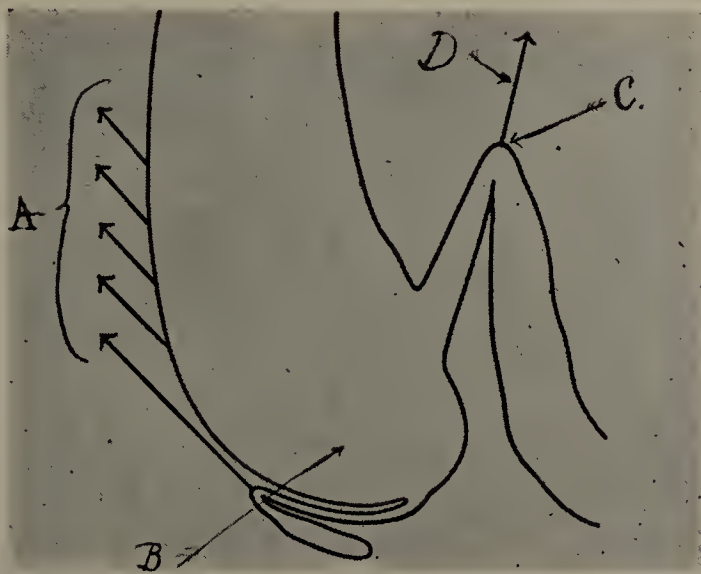


FIG. 5.

In the schematic illustration, Fig. 6, the "appendiceal tie" is represented. Figs. 6a and 6b represent the same condition as found in different patients at operation. In each case the appendix is caught with the adventitious band, and the cecum





FIG. 5A. Ulcer of stomach. A, Dilated duodenum. Angulated duodeno-jejunal junction. B, Lane's kink. C, Prolapsed transverse colon. D, "Jackson's membrane." E, Gastric dilatation.

and ileum are distended with fecal contents. When the ileum, which is shown in the figures as it is held up, is allowed to fall it drops over the appendix, and becomes kinked thereby, as shown in the diagram.

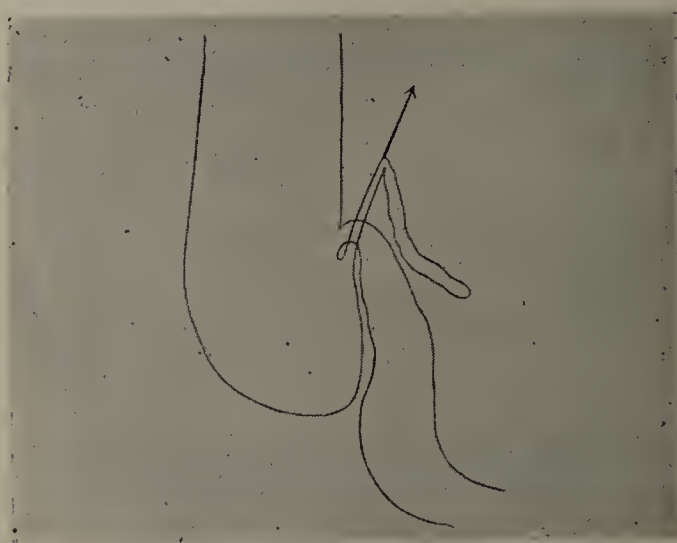


FIG. 6.

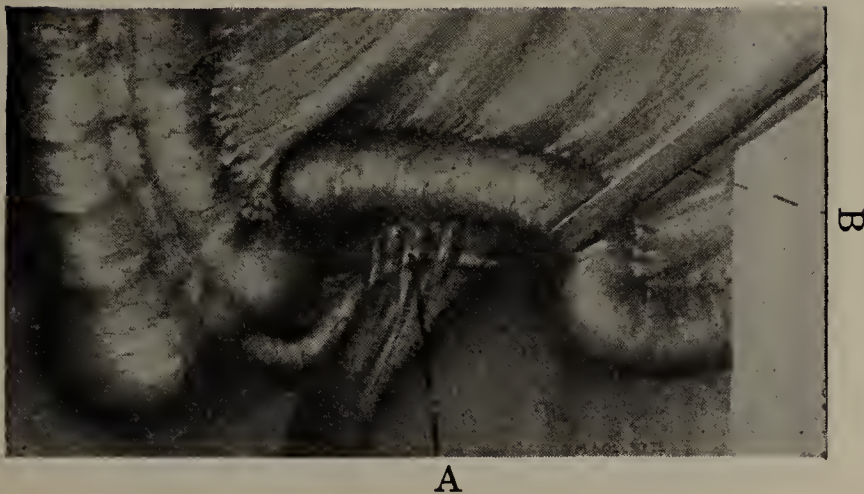


FIG. 6A.

(4) *In the region of the hepatic flexure and the first part of the transverse colon.* Fig. 7 shows this diagrammatically at A. Fig. 7a shows it as found at operation. Fig. 7b (same case) shows the descending colon kinked just above the pelvic colon.



FIG 6B.

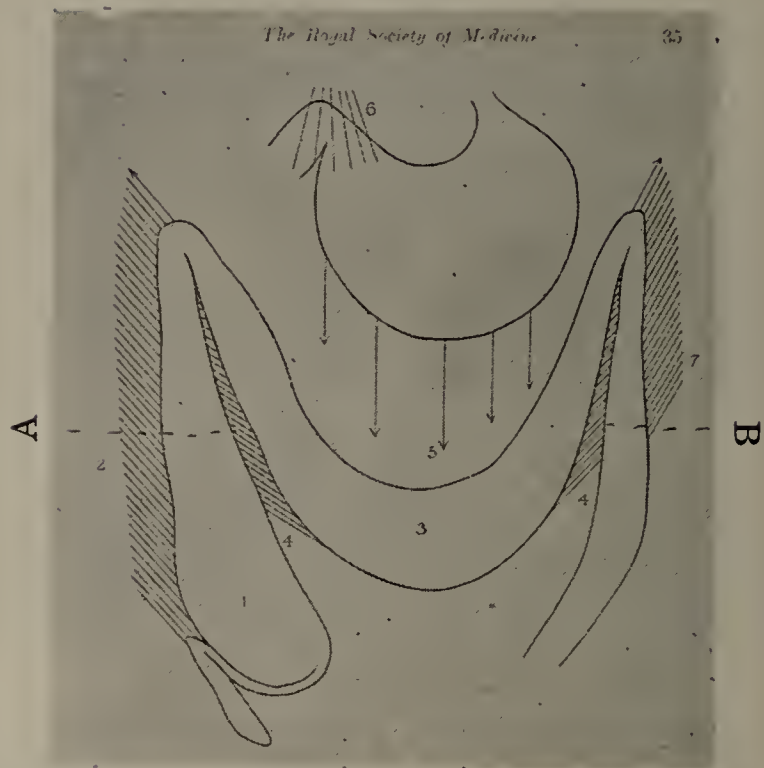


FIG. 7.



FIG. 7A.



(5) *At the splenic flexure.* This is diagrammatically shown in Fig. 7, at B., and as found at operation in Fig. 7b. (Same case as 7a.)



FIG. 7b.

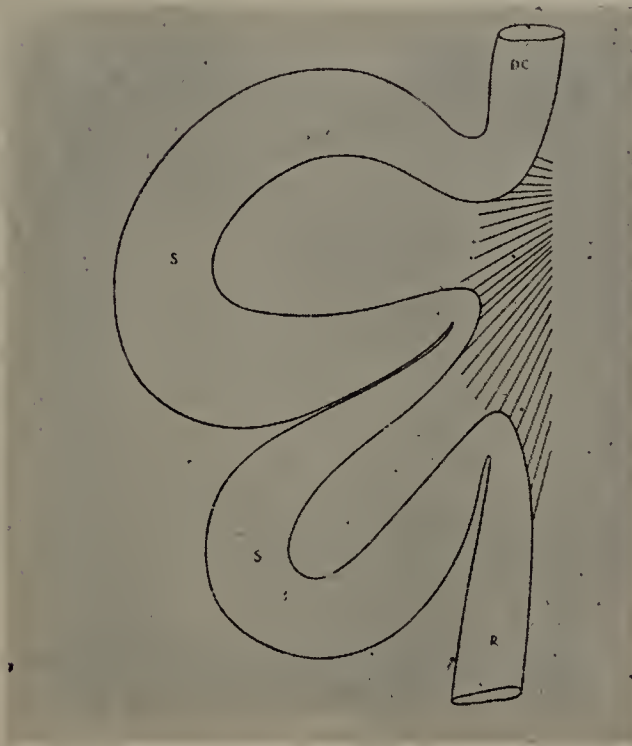


FIG. 8.

(6) *At the sigmoid loop.* This is diagrammatically given in Figs. 8 and 8a, and as found in the patient in Fig. 8b.

(7) *In the pelvic colon or rectum.* Sometimes the band which causes what Lane has called "the last kink," at the junction of the iliac with the pelvic portions of the colon, attaches

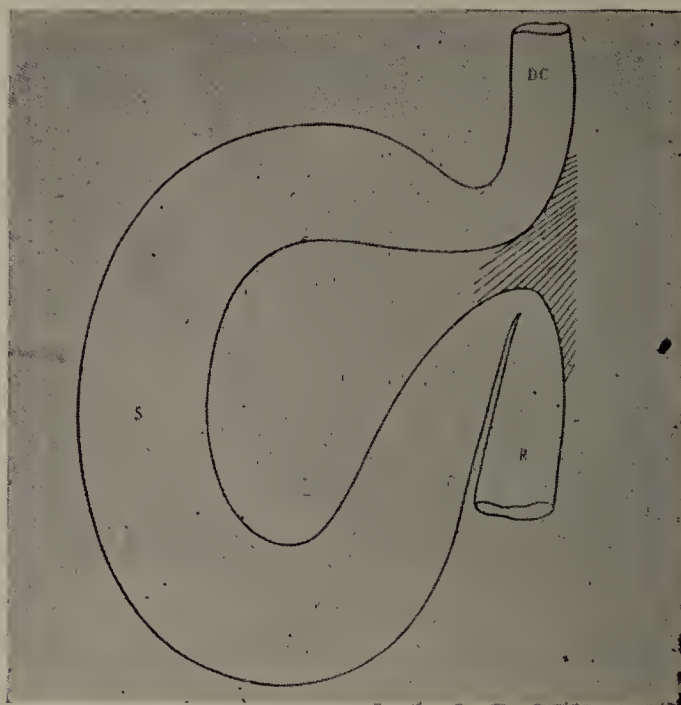


FIG. 8A.

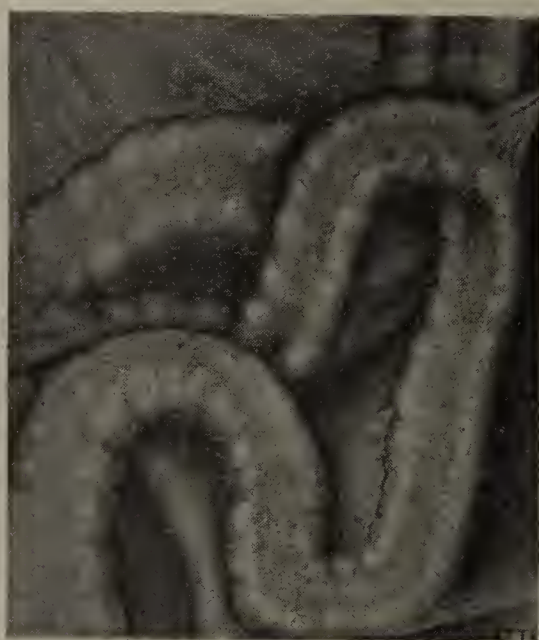


FIG. 8B.

itself to the ovary, as shown diagrammatically in Fig. 9, and in an actual case in Fig. 9a. The rectum may be involved in the kink.

I have endeavored to demonstrate in the foregoing pictures the alterations which may take place in the drainage system in consequence of the change from the supine posture of lower animals to the upright posture of man, or as the result of an

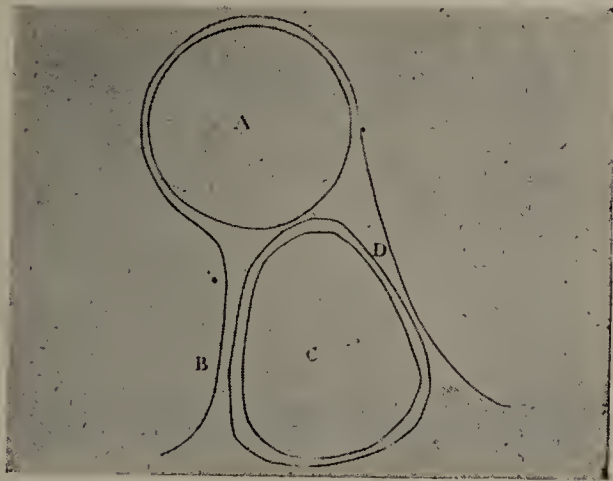


FIG. 9.

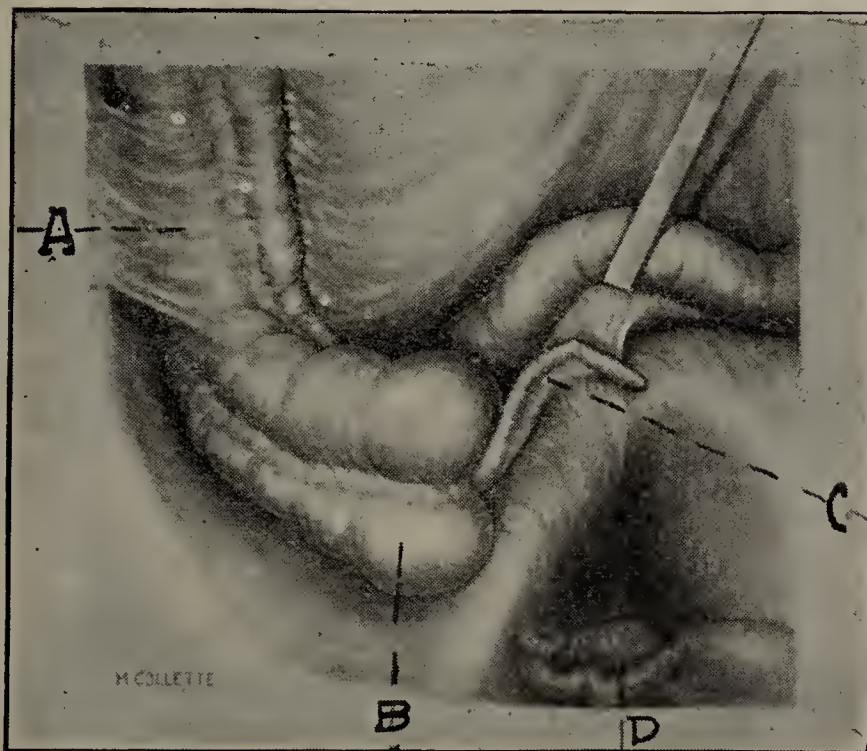


FIG. 9A.

inflammatory process; to show how nature attempts, by means of evolutionary bands, to offset the tendency to visceroptosis; and to illustrate some of the mechanical obstructions which occur through the kinking of the canal by these adventitious structures.



As an immediate result of the kinking of the gut there is a slowing in the passage of the contents, varying in degree according to the location of the kink, the severity of the interference, and various other factors. To the immediate condition resulting from this interference Lane has applied the term "chronic intestinal stasis."

Referring to the idea, maintained by some, that he is investing "simple constipation" with new importance and significance, Lane has said: "To many members of our profession, constipation apparently suggests merely the absence of a daily action of the bowels, but what I understand by chronic intestinal stasis is an abnormal delay in the transmission of the intestinal contents through some portion or portions of the gastro-intestinal tract, which delay may be accompanied by constipation or by a daily or even more frequent action of the bowels. In the complications which result, diarrhoea may be the more important and troublesome feature. Or to put it more succinctly, chronic intestinal stasis means a delay in a portion or portions of the gastro-intestinal tract, which results in the absorption into the circulation of more toxic matter than the organs, whose functions are to convert, convey, and eliminate it, can deal with."

"Simple constipation," which has been described as a "pathological condition characterized by insufficient fecal evacuation," and which is generally considered to involve the large bowel, particularly in its lower part, may exist to a marked degree without overtaxing the organs of digestion, assimilation and elimination to such an extent as to give rise to the symptomatology of autointoxication. This may be true of the degree of constipation to which the term obstipation is usually applied.

With chronic intestinal stasis, however, as defined by Lane, far-reaching results may ensue. "The gastro-intestinal tract," as he says, "is a living, sentient, drainage scheme, of which the several portions perform several functions, from which nutrient material is picked up by absorbing vessels, and into which certain organs discharge their contents. In some portions, organisms thrive normally; in others, the presence of the same organisms produces poisonous products which that segment of the tract is unaccustomed to deal with. These poisons, being absorbed, damage the tissues of the body, causing them to de-

generate, and reducing their capacity to combat successfully organisms which may invade them. Any delay in the passage of the contents of this drainage scheme has a threefold result on the organisms found in the intestine. Their multiplication is facilitated, they extend beyond the limits of their normal habitat, and extraneous strains are developed. These organisms may extend along the ducts of the organs which open into the drain-pipe, and they or their products, carried in the blood stream, may infect organs which do not directly communicate with the intestine, for example, the kidneys." "The excess of these poisons," he continues, "circulating through the body cannot be dealt with effectually by those organs whose business it is to render them as innocuous as possible. They produce progressive degeneration in every tissue, and a very definite and unmistakable series of symptoms results." Every tissue of the body is affected to a greater or less extent.

It is not my purpose here, however, to discuss in detail either the immediate or the remote effects of the kinking of the gut and the resultant condition of chronic intestinal stasis.

Accepting,—as I think one must do who brings to bear upon the entire subject an unbiased mind,—the fact of the existence of the adventitious intra-abdominal bands, of the kinking of the gut thereby, of the conditions of stasis, and of the long chain of symptoms of auto-intoxication which follows—accepting all this as at least a possibility, if not a probability and in many cases an actuality, the question then arises, to whose lot does it properly fall to play the role of plumber in the work of overhauling the human drainage system which is out of order? The question must be answered equivocally.

From a study of Lane's work and his cases, both by personal observation and by reading his published reports, and from my own experience and that of others, I have come to classify my cases of chronic intestinal stasis, according to treatment, under three general groups:

*First Group—Beginning cases*, in which, by preventive measures, a definite condition of stasis may be obviated.

*Mid Group—Mild cases*, in which, by preventive measures and by moderate surgical procedures, such as cutting bands, replacing hollow organs, changing angles, etc., the severer



degrees of stasis are forestalled and the necessity of more radical surgical measures may be obviated.

*End Group—Advanced cases*, in which, despite preventive treatment, or because of inefficient treatment, the condition progresses to the degree of stasis which requires the more radical surgical procedures, such as short-circuiting (ileo-colostomy), or ileo-colostomy with colectomy.

The selection of the plumber, then, is governed by the category under which the patient comes. In cases of the first group the internist or the gastro-enterologist, provided he is accustomed to avail himself of all the applicable diagnostic aids, particularly the X-ray and the fluoroscope, may make the diagnosis and apply the treatment with success. I have discussed this group of cases elsewhere and will not dwell upon it here.

The hygienic, dietetic and supportive measures which are applicable in the treatment of patients of the first group are equally applicable in the after-care of patients of the other two groups.

An essential part of this treatment is a properly fitted abdominal belt. Figs. 10, 11, 12, and 13 illustrate the Curtis Abdominal Belt, which has been found efficacious in many cases of all classes, and Figs. 14, 15, and 16 show a belt devised by Dr. Eliza M. Mosher, of Brooklyn, which is useful in selected cases.

In connection with the belt, it may be added that the mere matter of ordering a belt is not sufficient,—the belt must be adapted to the individual patient, and must be properly applied at all times, as may be demonstrated by X-ray examination. Any belt which subserves the purpose may be used as a temporary support to aid nature in the restoration of tone.

While, as I have said, the skilful internist and gastro-enterologist may successfully treat cases of the first group, some of these may be said to come equally properly, after all, within the domain of the abdominal surgeon, inasmuch as it is difficult to foretell when a case presenting the symptomatology of the milder degrees of stasis may come within the category of one demanding exploratory laparotomy, and perhaps radical operative interference.



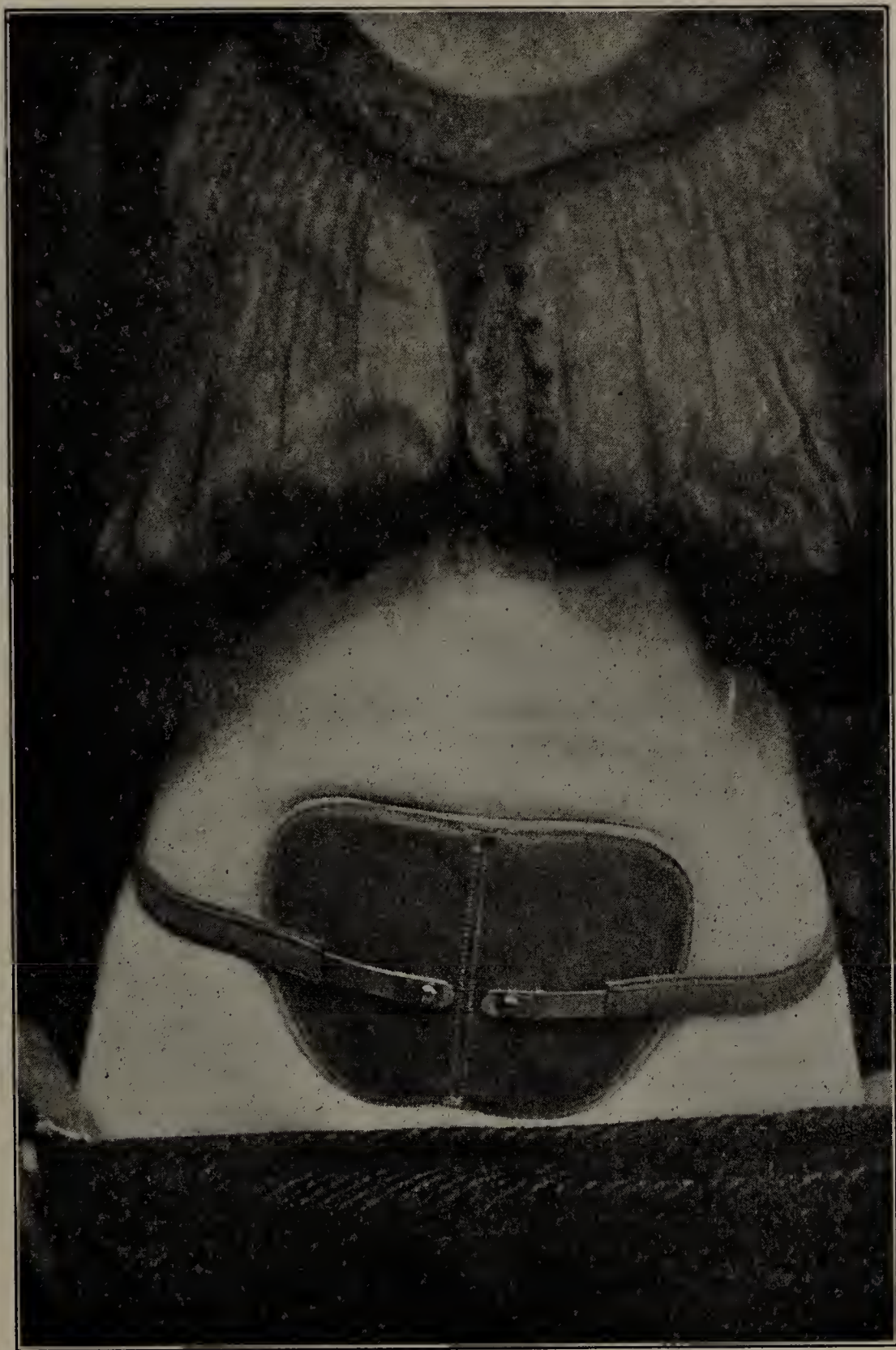


FIG. 10.—Curtis Abdominal Belt in position (front view).

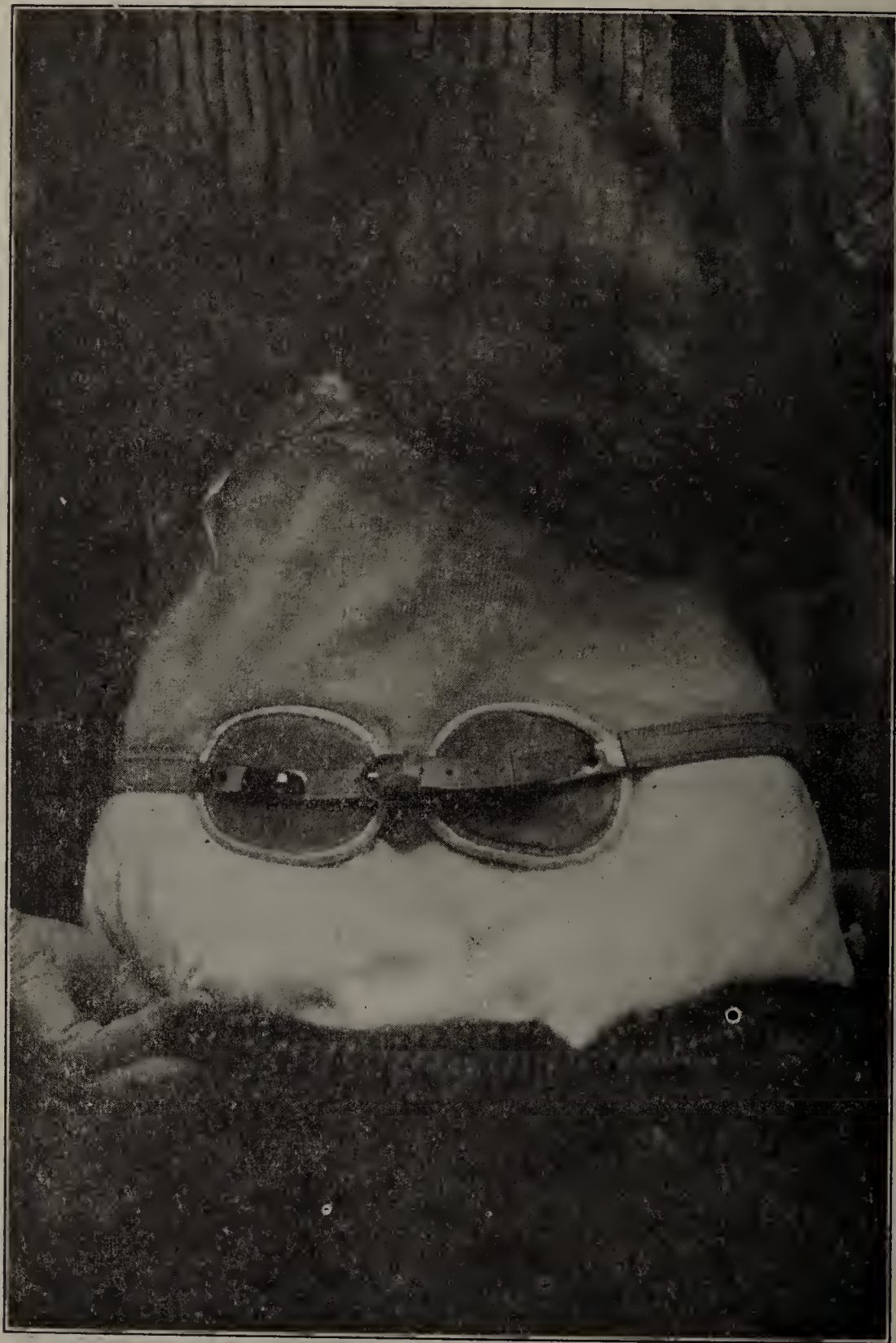


FIG. 11.—Curtis Abdominal Belt in position (back view).





FIG. 12.—Curtis Abdominal Belt in position, with corset over it (front view).



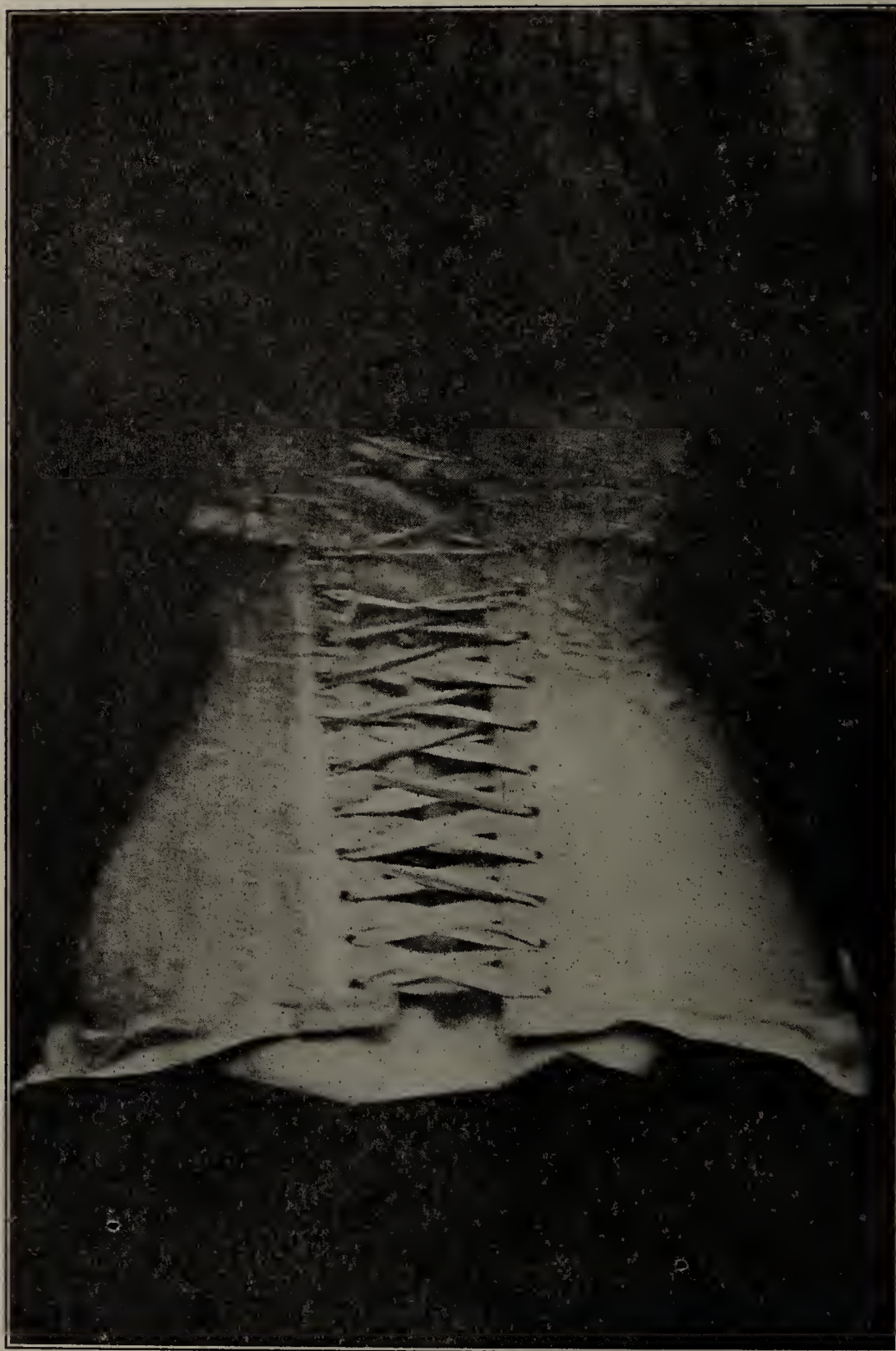


FIG. 13.—Curtis Abdominal Belt in position, with corset over it (back view.)



FIG. 14.



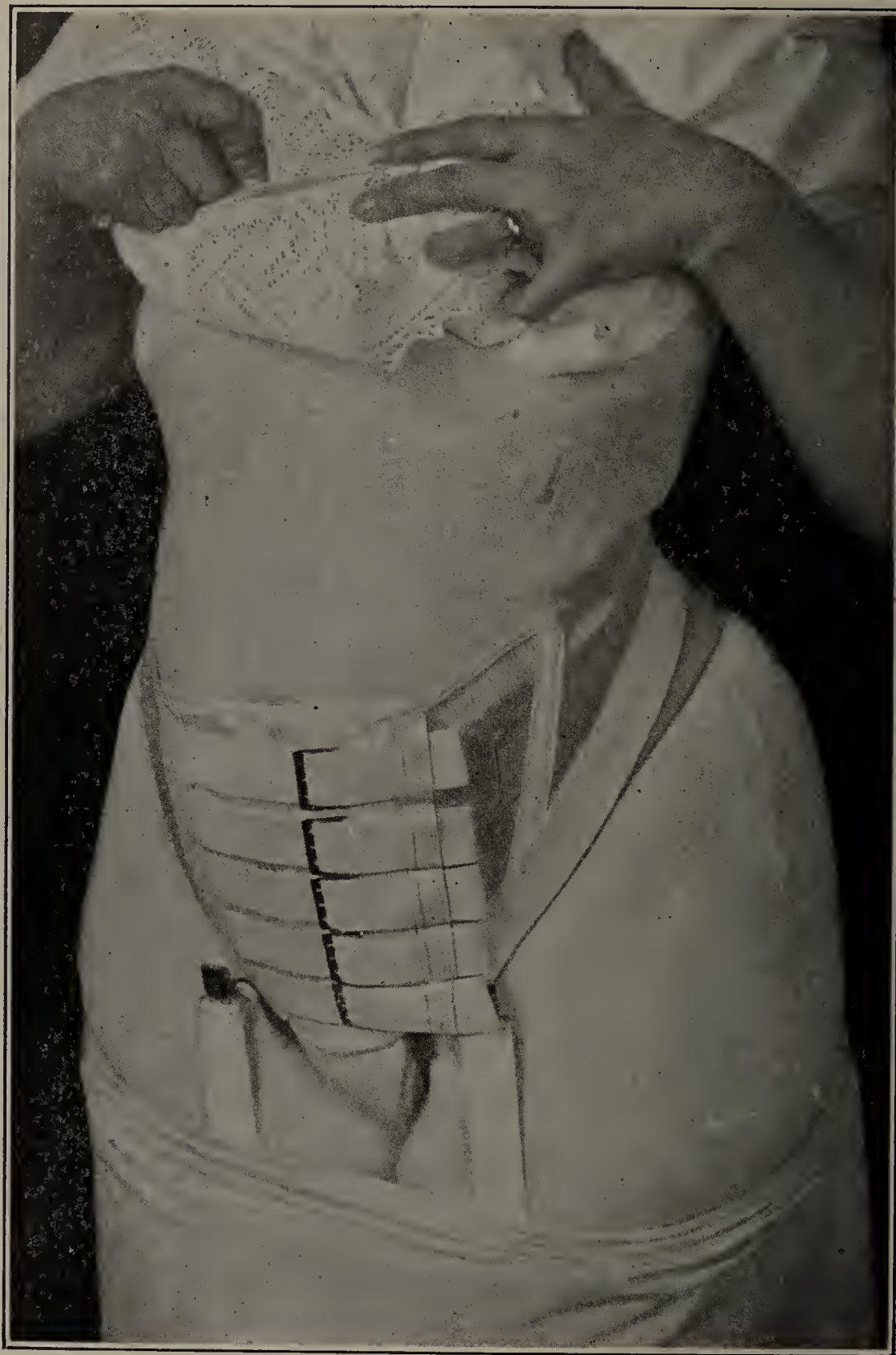


FIG. 15.





FIG. 16.

*Mid-group Cases.*—Whether from neglect, from inefficient treatment, from unavoidable inflammatory processes, or despite careful management, many cases of chronic intestinal stasis



FIG. 17.

progress to the stage in which preventive measures are insufficient. It then becomes necessary to perform laparotomy for the purpose of applying milder surgical procedures, such as are illustrated in the accompanying pictures:



FIG. 17A.

(1) *Cutting Bands.* Fig. 17 illustrates two conditions: A.—Ileo-pelvic band, kinking the ileum, which is thinned between the cecum and the band and the resulting kink, and very greatly distended beyond the band and the kink. B.—Band at-



taching the ascending colon to the lateral abdominal wall, causing stasis in the cecum. Fig. 17a represents the condition after the bands have been cut, the raw surfaces covered, and the gut restored to its normal position and mobility. The appendix, in this case, had been previously removed, by another surgeon, without permanent benefit.

It is important, in connection with such cases, to remember that these bands should be cut transversely and sewed up longitudinally, thus giving greater play to the constricted portion



B A  
FIG. 18.

of gut. Great care should be exercised, too, to prevent the leaving of any raw surfaces or rough edges, which would prove fruitful soil for the formation of adhesions.

(2) *Straightening Kinks and Angulations.* Figs. 17 (A) (previously shown) and 17a illustrate this, and likewise Figs. 18 and 18a.

By straightening these kinks one can "iron out," so to speak, other conditions. Fig. 18b, for example, shows an ulcer of the duodenum, caused, if Lane's views be correct, by the condition represented in Fig. 18. There was a constricting band across the duodenum (Fig. 18b-A), but the cutting of this and the leaving of the condition around the cecum, appendix and terminal ileum, would not have cured the duodenal ulcer (Fig. 18b-B.). By removing the appendix, cutting the band (Fig. 18-A), restoring the cecum to its normal position, and straightening the kinks in the ileum, plus the severing of the duodenal band, the patient was restored to normal health. Fig. 18c is another example of this.



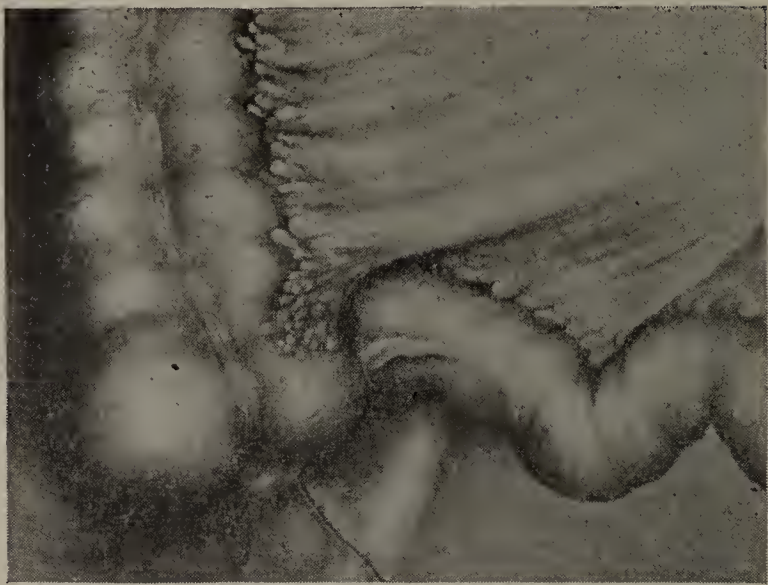


FIG. 18A.

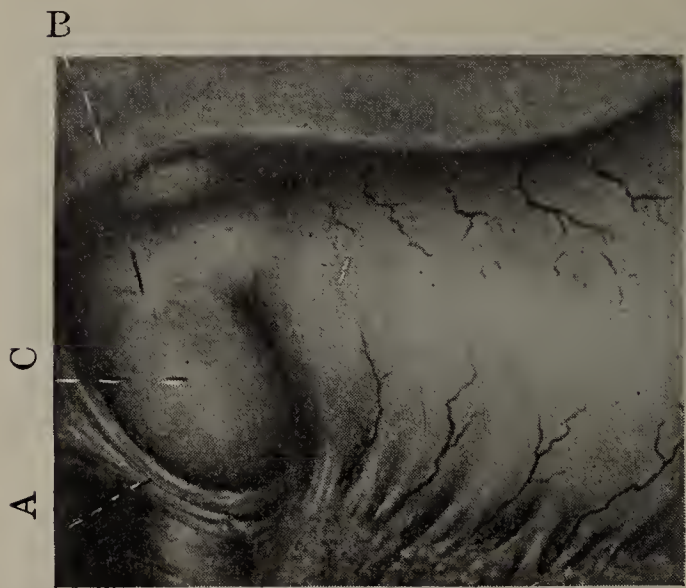


FIG. 18B.

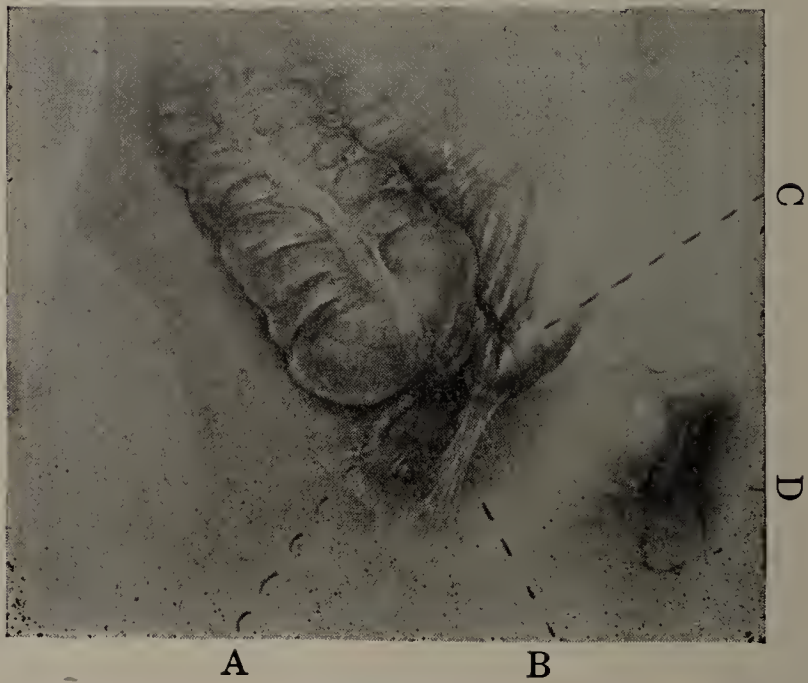


FIG. 18C.

(3) *Removing the Appendix.*—Figs. 18, 18a, and 18b. have already illustrated the advantages of removing the appendix in some cases in which this organ plays a part in the kinking of the ileum and in the misplacing of the cecum. Fig. 18c is a further illustration of this point.

(4) *Anchoring, Plicating, or Otherwise Dealing with Mobile or Distended Cecum.* The part played by the cecum in the production of chronic intestinal stasis has called forth much discussion and varied attempts have been made to deal with this particular part of the drainage canal in such manner as to relieve the symptoms caused by the undue extension or mobility.

Wilms devised a method of fixation of the elongated and mobile cecum in cases of "so-called appendicitis," which had for its object the making of a retroperitoneal pouch into which the cecum is placed. He claimed that flat adhesions are thus formed, which proved better than fixation by suture.

Blake proposed the method of plicating voluminous *seca*. He advised it only as a palliative measure, and only when the abdomen is opened for another purpose. It consists in simply stitching the ventral and lateral longitudinal bands of the cecum and ascending colon together after removal of the appendix. A non-absorbable continuous suture of silk or linen is used, and the stitches are placed about two centimeters apart, so that when drawn tight the length as well as the diameter of the gut is diminished. The plication is usually carried, according to Blake, ten to fifteen centimeters aborally.

I have employed the plication method, using interrupted stitches instead of the continuous suture, and extending the plication well up into the flank, to a point where the gut is fairly well fastened to the abdominal wall. Figs. 19, 19a, and 19b, illustrate the successive steps in the plication of cecum and ascending colon by this method.

It is yet to be determined whether any of these, and the various other methods devised for the prevention of stasis in the cecum will stand the test of time, and whether, after all, the cecum cases will not have to be carried over from the mid-group category, in which no attempt is made at removal, to the end group, in which removal of some portion or the whole of the large bowel, or at least diverting the course of the drainage, is the object to be attained.



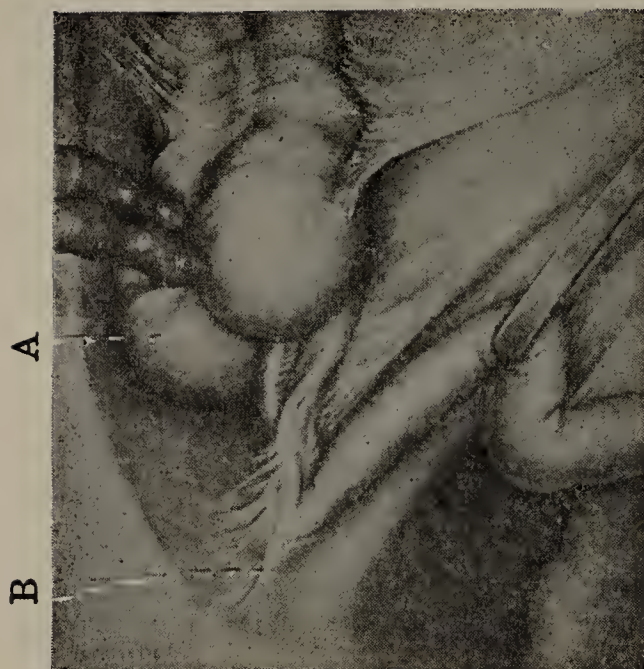


FIG. 19.

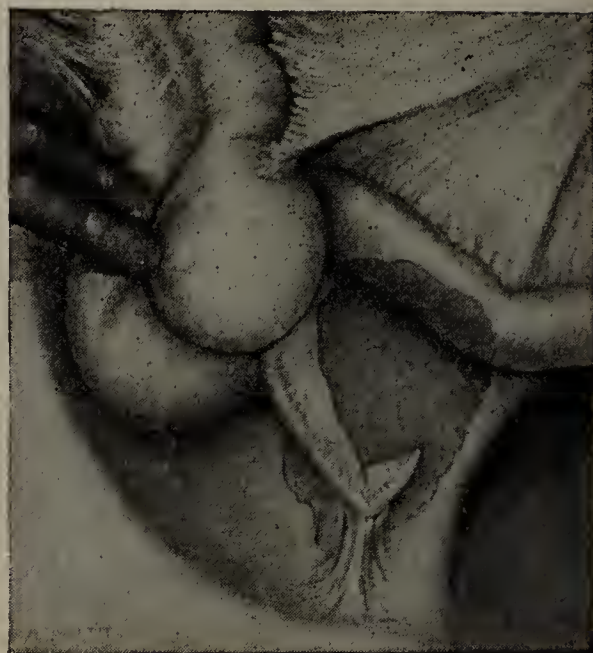


FIG. 19A.

(5) *Covering Raw Surfaces and Preventing Adhesions.* As all surgeons know, the prevention of adhesions has been and still is a surgical problem which has not been entirely satisfactorily solved. Cargile membrane, omental fat, paraffin, and various other agents have been tried, but none have met with unqualified success. It is particularly important, of course, in the abdominal cavity, that means be employed for the preven-

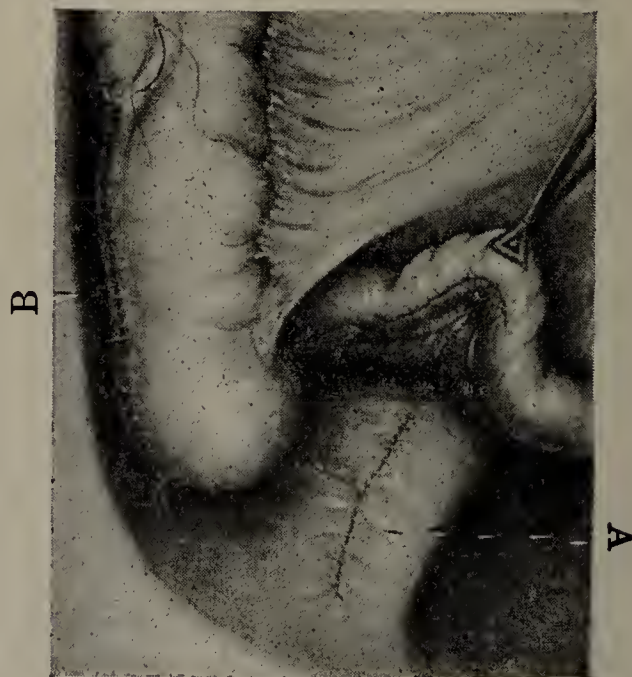
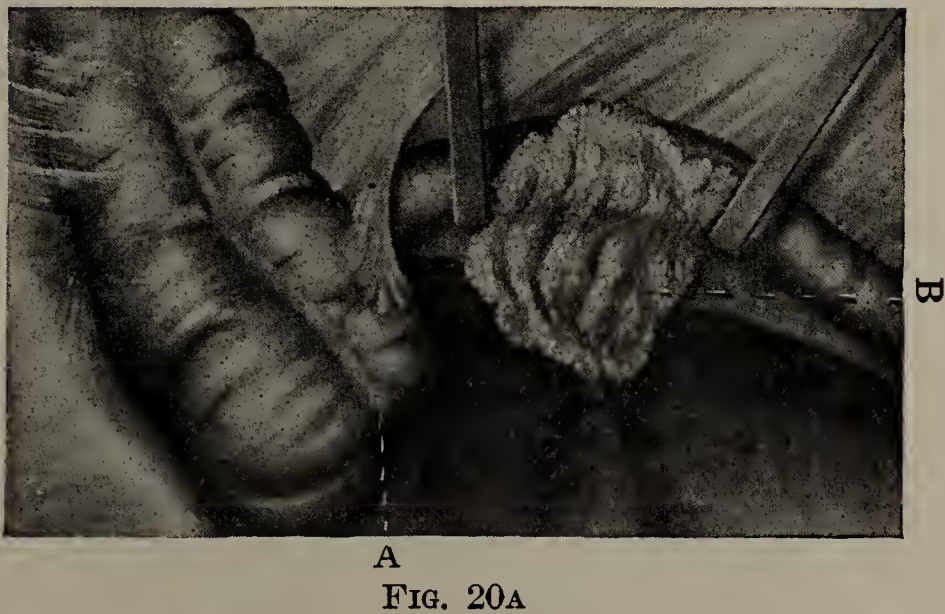


FIG. 19B



tion of the formation of adhesions after surgical intervention. Lane has recently suggested, and is employing, the method of introducing several pints of normal saline solution into the abdomen, just before closure of the wound, for the purpose of preventing adhesions.

Figs. 20 and 20a illustrate the severing of broad bands. Fig. 20a, at B, shows the covering over of the remain-



ing raw surfaces with a piece of detached omentum. Fig. 21 depicts extensive band formation, and Fig. 21a illustrates the method of covering the raw surfaces by means of omentum not detached, but simply sutured in place over the area to be covered.\*

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\*These patients are both doing well, one year after operation.

*End-group Cases.*—When Lane first observed the kink produced by acquired ligaments or bands, according to his own statement, he set about to devise means for the division of the



FIG. 21.



FIG. 21A.

bands and the covering of raw surfaces thus exposed, and for treating the ileum in order to prevent the recurrence of the kink. He soon found, however, that the freeing of the intes-



tine sometimes resulted in an acute obstruction, the free portion of the ileum refusing to transmit its contents. He also found that, even when the membrane had been divided and the



FIG. 22.



FIG. 22A.

patient had recovered from the operation, the toxic symptoms returned when active life was resumed. This, he says, was true in the more advanced cases. After extended experience,



especially where bismuth and X-rays showed that the ileal obstruction was accompanied by a marked degree of stasis in the large bowel, he left the ileal kink alone, and short-circuited by anastomosing the divided end of the ileum with the pelvic colon immediately below the last kink, exaggerating the pelvic kink if necessary.

Fig. 22 represents a condition in which the bands produced a generally snarled-up state of affairs. Bands were cut (the appendix had already been removed by another surgeon), the kinks and angulations were straightened, the cecum was restored to its normal position—in short, everything was done that was feasible in the effort to cure the patient without subjecting him to a short-circuit operation, to which his physician would not agree.

Despite this, however, the patient returned one year later, no better, with the conditions found in Fig. 22a. Ileo-colostomy was then performed, with perfect drainage.

*Care of Patient Before, During, and After Operation.*—The care of the patient before, during, and after operation is the same for ileo-colostomy and for colectomy, and it is of the utmost importance in either case. As we have already stated, the hygienic, dietetic and supportive measures which are applicable in the management of patients of the first group are equally applicable in the after care of patients of the other two groups.

In all cases of stasis it is well to bear in mind the possibility of acidosis. If the urine shows acetone, and if the body fluids are highly acid, a longer time is required for preparation for operation. I generally take a week or so longer, during which time plenty of alkaline fluids are given. If it is difficult to bring the urine down to the neutral point the bowel may be irrigated with a solution of bicarbonate of soda for several days before operation. Dextrose water—a teaspoonful of dextrose to a glassful of French vichy—as often as it can be taken, is beneficial.

The immediate preparation of the patient for operation is commenced two days before. An ounce of castor oil is given, followed by a soap enema night and morning for two days. During this time the patient is kept on a strict liquid diet. A half-ounce of brandy every four hours may be given to weak and delicate patients. The entire abdomen is subjected to the

most careful sterilization. An hour before operation an injection of morphia,  $1/6$  gr., with atropin sulphate,  $1/50$  gr., is administered, followed by the open ether method of anesthesia.

When the patient is anesthetized, infusion needles are inserted subcutaneously into the axillae, previously painted with iodine, and normal saline solution is administered throughout the operation, usually from four to six pints being absorbed. For this purpose Lane's hypodermoclysis apparatus is employed. A rectal tube is inserted during the operation, after the anastomosis is made and before the abdominal wall is closed. When the patient is returned to bed this tube, which is attached in place near the anal outlet, is connected with a long piece of rubber tubing, and drains into a receptacle at the side of the bed. It remains in for six days. The average drainage is about fourteen to twenty ounces a day.

When completely recovered from the anesthetic the patient is placed in the true Fowler position, practically sitting upright in bed. It is important to so arrange the patient in bed that comfort is maintained, abdominal drainage secured, and the dangers of post-operative respiratory trouble reduced. For the first two days after operation the pulse is taken every hour and the temperature every four hours. The sutures are removed, as a rule, on the fourteenth day, and a gauze dressing applied. For the first two days the patient is given only water, egg albumen, beef juice, plasmon and brandy, for the next four days, going on gradually to jelly and custards. During convalescence nothing heavier than fish and chicken is given. Pure liquid paraffin (Russian Mineral Oil) one ounce or less three times a day, for as long as is necessary, is given after the third day. The oil is no panacea, but merely acts as a lubricant, facilitating the passage of the intestinal contents. It may be noted that a pure, unperfumed oil is desirable, the aromatic oils, as a rule, being suggestive of impurities. It is better to add a little essence of orange or lemon, or the desired aromatic, as given. Milk of magnesia may be used as needed, if the Russian Mineral Oil is not borne well, or until the patient sits up. The patient is usually allowed up on a couch at the end of the fourth week, and is discharged at the end of the sixth week.

It is always to be remembered that the care of the patient is not ended with the operative procedure. Correcting



the defects in the drainage system by surgical intervention merely paves the way for the patient to become perfectly well. Unless nature is now assisted in her efforts at general restoration of the tone of the system, it will be no difficult matter for the patient to lapse again into an unsatisfactory condition. In order to prevent this, the hygienic, dietetic, and supportive measures previously mentioned must be employed until, like the crutches of the healed cripple, they may be discarded.

*Technic of Ileo-colostomy (Short Circuit).*—The incision, to the left of the median line, divides both layers of the rectus, and extends from about two inches above the umbilicus nearly to the symphysis pubis. The peritoneum divided, and the parts properly protected by sterile cloths, a thorough examination is made of abdominal contents. Ileo-colostomy having been determined upon as the result of this examination, the ileum is grasped by two compression forceps, which are placed transversely across it and as close together as possible. The bowel between the forceps is cut through with the cautery. As a rule the point at which the ileum is cut through is within a few inches of its termination, though this varies with circumstances. A suture is threaded through the distal end of the ileum, including the forceps in its several loops. The forceps are then removed, and the thread tightened and knotted, this end of the ileum being thus secured. The sutured end is next invaginated. The pelvic colon is now drawn up into the incision, emptied of its contents, and grasped between the blades of Lane's gastro-enterostomy forceps. The proximal end of the ileum is emptied of its contents, with a very light pair of compression forceps it is held in position against the part of the colon at which the juncture is to be made. An incision along the length of the colon is made, of a size corresponding to the calibre of the ileum. The ends of the ileal aperture and of the aperture in the colon are secured by toothed forceps. The adjacent margins of the apertures in ileum and colon are now securely united by means of a button-hole suture. The controlling forceps are removed, the ileo-colostomy junction reinforced by one or two additional rows of sutures which perforate the peritoneal and muscular coats, the small intestines are drawn upwards out of the pelvis, and are held in this position while the free surfaces of the pelvic mesentery are attached to the free surface of the mesentery of the ileum by a button-hole suture.



An esophageal tube (Fig. 34) is inserted into the anus and passed along the rectum, its passage being facilitated by injecting paraffin into the tube by means of a Higginson syringe. The tube is passed through the opening in the colon, and for about twelve inches along the ileum. It is secured in the anal region in the male and to the back of the vulva in the female. This is connected to the tubing and vessel referred to in the after-care of the patient.

In some of his earlier cases Lane did a side-to-side anastomosis of the small intestine with the large. He found, however, that in some instances a diverticulum developed, as shown in Fig. 23, which is one of Lane's own cases. It then became necessary to remove the diverticulum at a subsequent operation. In order to obviate this contingency, for a number of years he has been doing the end-to-side anastomosis described above, with very much more satisfactory results. Others, as Hirschman, of Detroit, still prefer the side-to-side anastomosis, holding that it has no disadvantage provided the opening is made large enough.

The successive steps of the ileo-colostomy operation are shown in Figs. 24, 25, 26, 27, 28, 29, 30, and 31.

About five per cent. of the cases which have been short-circuited, in Lane's earlier experiences, subsequently returned for colectomy. More recently he claims to be able to tell fairly accurately whether colectomy is required in the first place. If the splenic and hepatic flexures are very low down, and if the transverse colon hangs way down to the pelvis, colectomy is indicated in his judgment.

Many methods have been devised for dealing with the end-group cases in the effort to combat the condition without resort to colectomy. Rovsing, Eve, Duret, Reed, Coffey, Mayo, and others have devised or have practised methods of dealing with the visceroptosis, with redundancy in certain portions of the gut, or with the condition of stasis as an entirety as the result of interference with drainage in a given portion or portions of the canal, particularly in the cecum and colon. It is not within the province of this communication to discuss the merits or demerits of these, or to give the details of technic employed. It may be said that no method yet suggested is ideal. All are yet in the stage of evolution of the entire subject which calls for additional experience. Some of the sug-



FIG. 24.

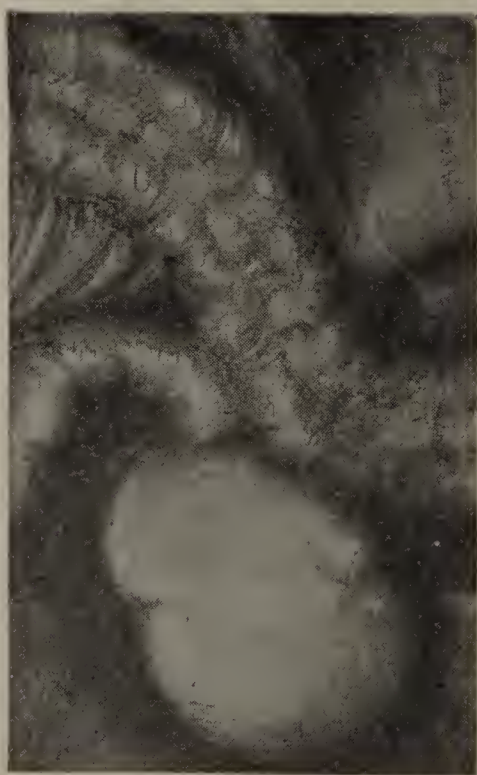


FIG. 23.

A



FIG. 25.





FIG. 27.



FIG. 28.

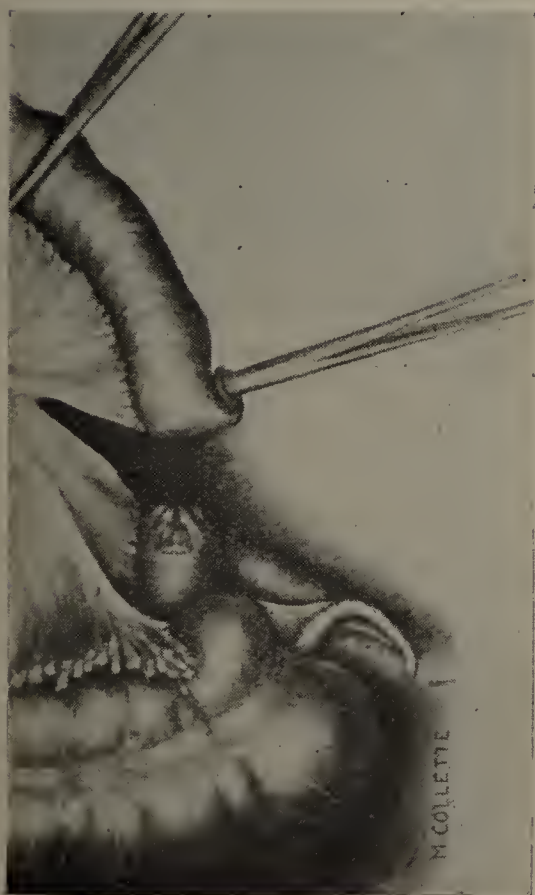


FIG. 26.



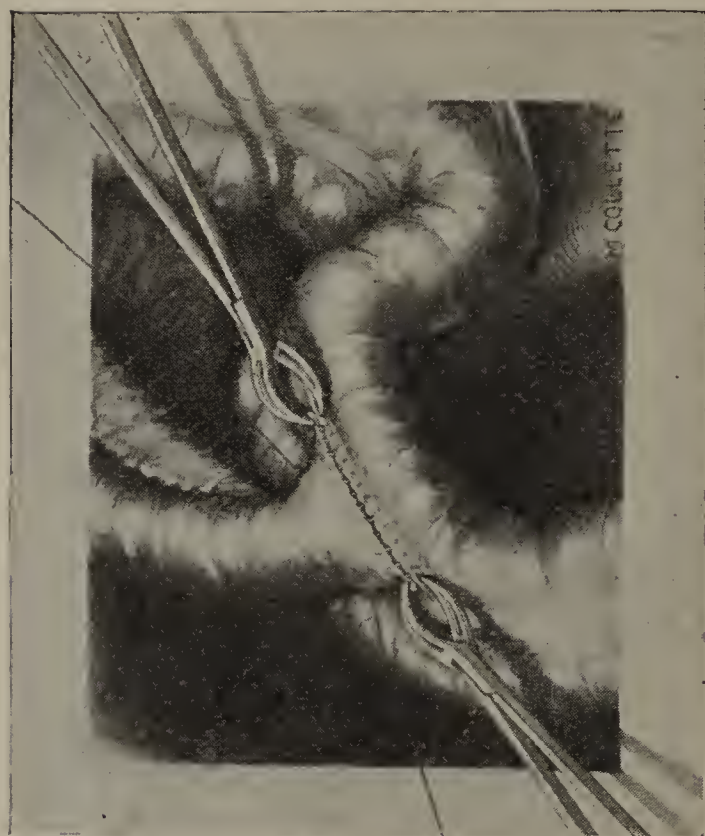


FIG. 30.

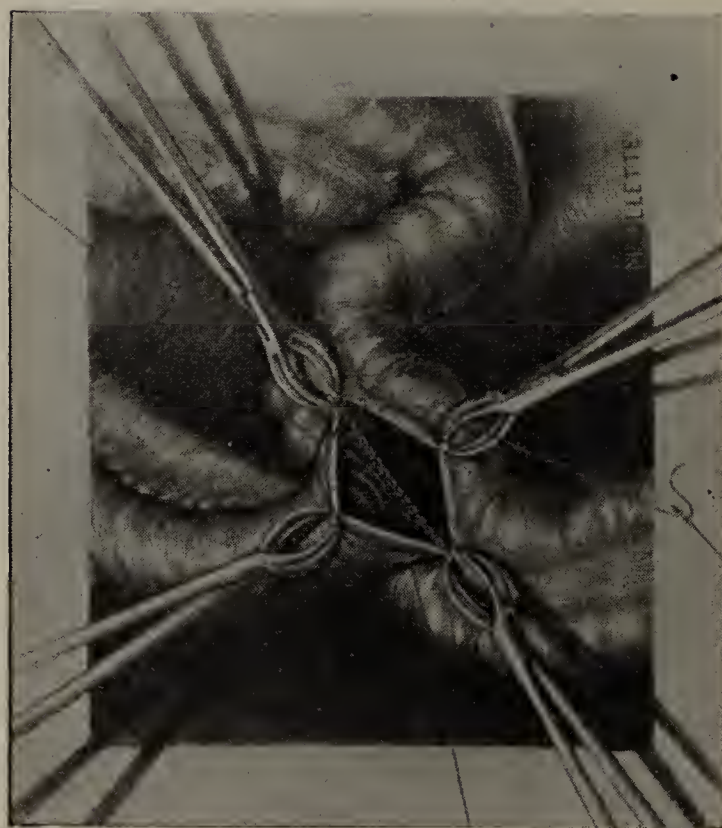


FIG. 29.

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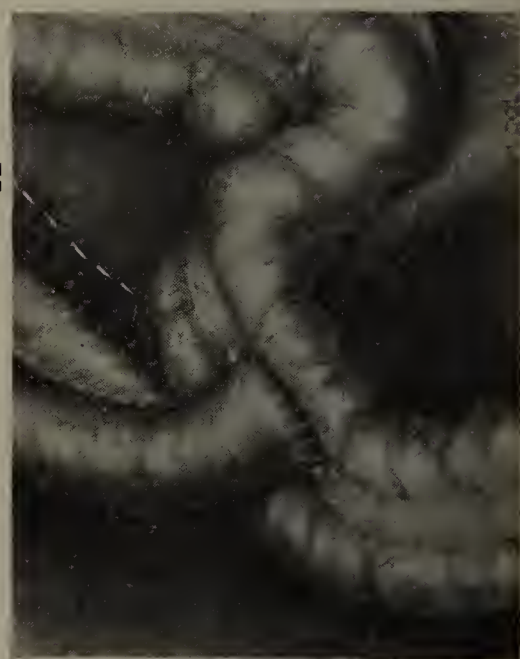


FIG. 31.

gestions appeal to us as more or less illogical, surgically, others as meeting certain requirements. Taking the subject as a whole, and considering the majority of the end-group cases, the method as practised by Lane, seems to come more nearly to meeting all demands than any other method proposed.

Partial colectomy is employed by some operators, and is still in the developmental stage in its application to chronic intestinal stasis. It may consist in ileo-colostomy (ileum to transverse colon), with removal of the ascending and part of the transverse colon, and cecum. Lane, years ago, tried and

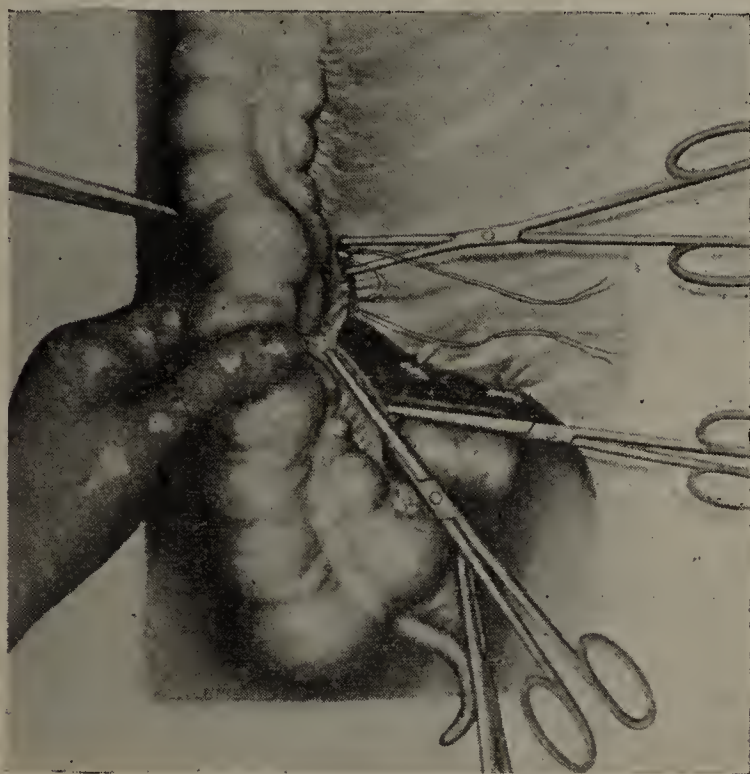


FIG. 32.

discarded the procedure, strongly urging its inadequacy, as a rule, in cases of stasis demanding the removal of the bowel.

*Technic of Colectomy.*—An incision of the same kind but a little longer than the one employed for ileo-colostomy alone is made when colectomy is to be performed. The importance of making a free incision is to be emphasized. It is essential that a full view of the abdominal cavity be obtainable.

Ileo-colostomy (according to the technic just described) having been performed on a previous occasion, or as a preliminary step of the present operation, the large bowel is now separated one and a half to two inches above the ileo-colic junction. This is accomplished, as in the case of the ileum, by



grasping the bowel between two forceps and dividing between with the cautery. The meso-colon from the cecum on is tied off in sections (Fig. 32), and the large bowel, thus exsected, is removed from the abdominal cavity. The cut end of the

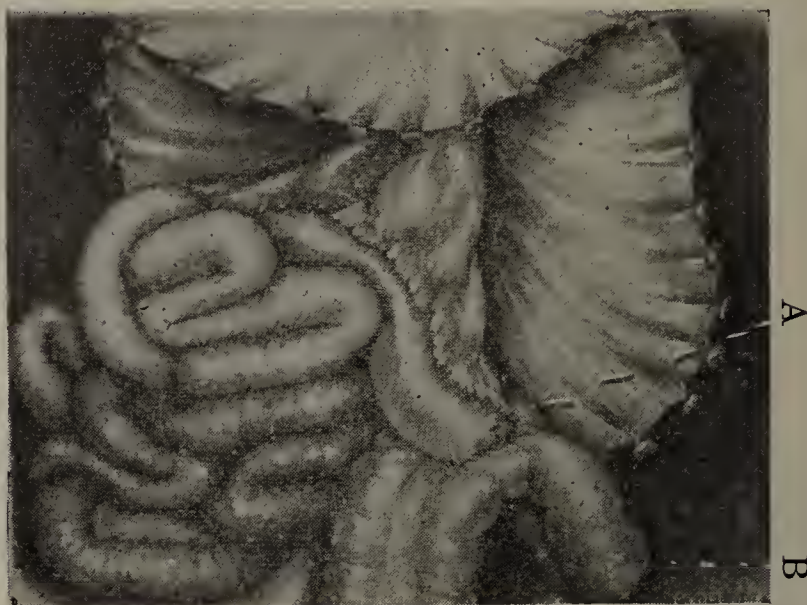


FIG. 33.



FIG. 34.

pelvic colon is closed with a running suture, and is buried, about on a level with the upper limit of the ileo-colostomy, by means of an encircling suture which includes the peritoneal



and muscular coats. In order to prevent subsequent sacculatation, the cut end may be closed and sutured to fascia of pelvic wall, as shown in Fig. 33. The esophageal tube is passed in the same manner as in ileo-colostomy (Fig. 34), and the after-care of the patient is the same.

Lane, in a recent personal communication, says he now thinks it better to do an end-to-end anastomosis in the colectomy operation, where ileo-colostomy and colectomy are performed at the same time.

While these surgical procedures, and the various methods of intervention which have been proposed, may not be ideal, the condition of chronic intestinal stasis, as we now understand its far reaching import, certainly calls for radical intervention in some cases, and the methods described seem to be the best suggested up to the present moment. With continued study of these cases and their treatment, undoubtedly the ideal method will be evolved. Furthermore, many other knotty problems in medicine and surgery may be cleared up through the study of chronic intestinal stasis. We are not all in accord with all Lane's views concerning the association of other diseases with chronic intestinal stasis from an etiological point of view, but it cannot be definitely stated, at this stage of the evolution of the entire subject, that he is either right or wrong. In my own experience some remarkable surprises have been encountered, which have pointed the way to further investigation. For example, in a number of cases of chronic intestinal stasis in subjects who are epileptic, operation for stasis has appeared to cause complete cessation or marked decrease in frequency and severity of the attacks of epilepsy. It is too early yet to forecast the ultimate outcome of such cases, but there is reason to believe that in some cases of epilepsy of other than central origin amelioration if not cure may be obtained by the permanent cure of chronic intestinal stasis. Melancholia, lumps in the breast, albumin and casts in urine, and other untoward conditions, have disappeared after relief of stasis. Lane has long contended that cancer, among other diseases, is associated etiologically with chronic intestinal stasis. Such a contention is manifestly difficult of proof, but should nevertheless be given careful consideration. An illustrative case is shown in Fig. 35.

Every imitator of a new regime, every originator of a new theory, every pioneer who blazes a new trail, is called by his compeers an extremist, a hobbyist, a faddist. So, with Sir Arbuthnot Lane, with regard to chronic intestinal stasis, the theories evolved and the treatment devised. It has been said that he has gone too far with his theories, and that his treatment, in some cases, has been inexcusably radical. Recalling, however, the fact that he has proved a brilliant explorer into other hitherto unrecognized fields, and that he has already revealed certain previously unknown and now well-established points with reference to chronic intestinal stasis, may we not

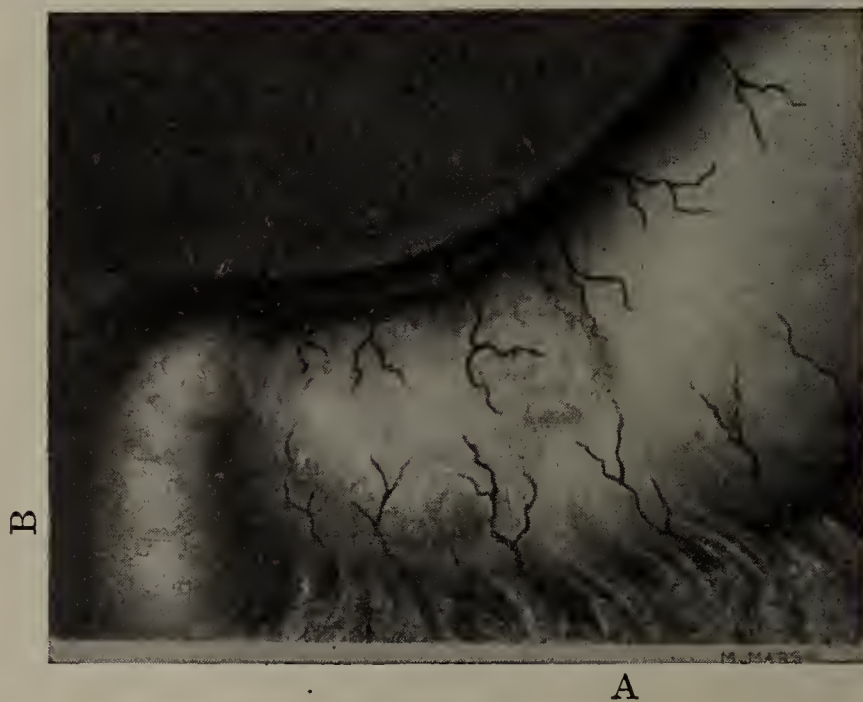


FIG. 35.

safely, and with conservative care, follow his lead further and further, until what is controversial today as regards both the theoretical and the practical considerations in relation to the human drainage system, will be the established fact and practice of tomorrow?

#### ILLUSTRATIONS.

FIG. 1.—Diagram (from Lane) representing the several variations from the normal which the large bowel may undergo. The normal condition is shown as a firm line; the altered condition, as a dotted line. Note the prolapse of the cecum and transverse colon, the telescoping of the iliac colon and the elongation of the pelvic colon.



C.=Cecum.

T. C.=Transverse Colon.

B. T. P.=Brim of True Pelvis.

I. C.=Iliac Colon.

The hepatic and splenic flexures are drawn up and kinked by the development of acquired resistances, shown as arrows.

FIG. 2.—Diagram (from Lane) representing: A.=Normal curve of duodeno-jejunal junction. B.=Angulation of duodeno-jejunal junction by bands. C.=Nature's efforts, by the formation of bands, to prevent angulation.

FIG. 3.—A.=Duodeno-jejunal kink. B.=Dilated Duodenum, showing through omentum. C.=Transverse colon held up.

FIG. 4.—A.=Normal condition of stomach, small intestine and cecum. B.=The several changes which result from ileal obstruction. (From Lane.)

FIG. 4A.—A.=Ileo-pelvic Band. B.=Retractor holding up kinked and dilated ileum. C.=Band constricting duodenum. D.=Ulcer constricting pyloric outlet. E.=Dilated duodenum.

FIG 4B.—A.=Ileo-pelvic band. B.=Ileal kink. C.=Omentum adherent to cecum, which is twisted thereby. D.=Omentum extending from stomach and adherent to cecum and ascending colon.

FIG. 4C.—A.=Duodeno-jejunal kink. B.=Dilated duodenum.

FIG. 5.—Diagram (From Lane). A.=“Jackson's membrane,” the lower part of which involves the appendix. B.=The distended loaded cecum. C.=Ileum kinked by band D. D.=Band kinked ileum.

FIG. 5A.—(From B. M. J., Nov. 1, 1913.)—A.=Dilated duodenum. Angulated duodeno-jejunal junction. B.=Lane's band (ileo-pelvic) and kink. C.=Prolapsed transverse colon. D.=“Jackson's membrane.” E.=Dilated stomach.

FIG. 6.—Diagram (From Lane) representing: “Appendiceal Tie,” with ileum kinked above by the appendix, and distended below.

FIG. 6A.—A.=Appendix caught in ileo-pelvic band. B.=Retractor holding up ileum, which, when dropped, falls over appendix and forms an “appendiceal tie,” as shown diagrammatically in Fig. 6.

FIG. 6B.—Another illustration of the “appendiceal tie.” A. and B. the same as in Fig. 6a.

FIG. 7.—Diagram (From Lane) representing: 1. Prolapsed cecum. 2 and 7. The crystallized resistances which tend to oppose the downward displacement of the large bowel and sustain some of the weight of the transverse colon transmitted through the crystallized resistances, 4. 3. Transverse colon. 4. Crystallized resistances. 5. Por-

tion of the weight of the transverse colon transmitted through the great omentum to the convexity of the stomach. 6. The acquired ligament that secures the duodenum and pylorus to the under surface of liver and gall-bladder. A.=Bands between ascending and transverse colon. B.=Bands between transverse and descending colon.

FIG. 7A.—A.=Bands between ascending and transverse colon. B.=Bands between transverse and descending colon.

FIG. 7B.—A.=Dilated stomach. B.=Splenic flexure. C.=Band constricting descending and end of transverse colon, causing considerable constriction.

FIG. 8.—Diagram (From Lane) showing fixation and obstruction of sigmoid.

FIG. 8A.—Diagram (From Lane) showing diverticulitis of sigmoid produced by approximation of the two ends of loop of sigmoid.

FIG. 8B.—Elongation of pelvic colon, with the formation of bands in the condition of acute obstruction by volvulus around the bands.

FIG. 9.—Diagram (from Lane) showing: A.=Colon in transverse section. B.=Original mesentery. C.=Cystic ovary lying free in a cavity. D.=Remains of acquired adhesions.

FIG. 9A.—A.=Pericolic membrane ("Jackson's membrane"). B.=Mobile cecum. C.="Appendiceal tie." D.=Ovary involved in ileo-pelvic band.

FIG. 10.—Curtis Abdominal Belt in position (front view).

FIG. 11.—Curtis Abdominal Belt in position (back view).

FIG. 12.—Curtis Abdominal Belt in position, with corset over it (front view).

FIG. 13.—Curtis Abdominal Belt in position, with corset over it (back view).

FIG.—Mosher Belt, side view.

FIG. 15.—Mosher Belt, front view.

FIG. 16.—Mosher Belt, back view.

FIG. 17.—A.=Ileo-pelvic band. B.=Band constricting ascending colon.

FIG. 17A.—Conditions in Fig. 17 corrected by transverse division of ileo-pelvic band and longitudinal suture. Division and suture of band over ascending colon. Fixation of cecum.

FIG. 18.—A.=Ileo-pelvic band. B.=Mobile cecum.

FIG. 18A.—Fig. 18, after operation.

FIG. 18B.—A.=Band over duodenum constricting it. B.=Pyloric ulcer, with obstruction. C.=Dilated duodenum.



FIG. 18c.—A.=Appendix with adhesions. B.=Ileo-pelvic band. C.=Dilated ileum. D.=Condition corrected.

FIG. 19.—Condition found at operation. A.=Much enlarged Mobile cecum. B.=Ileal kink.

FIG. 19A.—Band severed transversely, leaving raw surface to be covered; kink relieved.

FIG. 19B.—A.=Raw surface covered with flaps of peritoneum by interrupted stitches. B.=Cecum and ascending colon plicated and fixed to abdominal wall.

FIG. 20.—(From B. M. J., November 1, 1913.)—A.=Pericolic membrane ("Jackson's membrane"). B.=Appendix kinked behind cecum. C.=Ileo-pelvic band.

FIG. 20A.—Conditions in Fig. 20 corrected. A.=Appendix removed. B.=Piece of detached omentum covering area of band severed, impossible to cover by suturing.

FIG. 21.—A.=Inflammatory adhesions following appendiceal abscess; twisting of cecum and obstruction of ileum.

FIG. 21A.—Conditions in Fig. 21 corrected. Raw surfaces covered by omental flap still connected with omentum.

FIG. 22.—A.=Ileo-pelvic band. B.=Many adhesions around cecum and ascending colon from appendicitis, with operation. C.=Adherent omentum. D.=Ileum totally obstructed with patient in upright position; no bismuth passing through ileum to large intestine.

FIG. 22A.—Same patient, showing condition one year later. Adhesions had reformed, despite placing bowel in better position at previous operation.

FIG. 23.—Diverticulum (A), developing after ileo-colostomy. Lane's case.

FIG. 24.—Incision to one side of middle line, dividing both layers of sheath of rectus, from two inches or more from umbilicus to symphysis pubis. Abdominal wall covered with sterile gauze; clamps in place.

FIG. 25.—Severance of terminal ileum by the cautery. Clamps in position.

FIG. 26.—Terminal ileum severed. Distal end tied off and turned in; proximal end rolled and held in clamp.

FIG. 27.—Purse-string stitch around terminal ileum, ready for inverting the stump.

FIG. 28.—First line of sutures being inserted.

FIG. 29.—Opening made in pelvic colon below last kink; aperture of severed ileum held open by clamps; through-and-through suture being inserted.

FIG. 30.—Superficial Lembert stiches being inserted.

FIG. 31. Anastomosis completed. Dead space in pelvis closed by stiches (A).

FIG. 32.—Putting in ligatures, ligating ascending mesocolon and mesocecum with double layer of strong black linen.

FIG. 33.—Anastomosis completed, whole gut removed down to last kink. A.=Anastomosis. B.=Cut end of colon sutured to fascia of pelvic wall.

FIG. 34.—Rubber drainage tube in place.

FIG. 35.—A.=Carcinoma of stomach. B.=Distended duodenum, resulting from kink at duodeno-jejunal junction.





